What is claimed is:

1. A protection switching mechanism comprising:

a multiplexer having an input coupled to receive an input signal and a plurality of outputs to output a plurality of output signals;

a transmission path for each output of the multiplexer, each transmission path coupled to receive an associated output signal from the multiplexer, the transmission paths further including one or more redundant transmission paths, wherein signals directed to a faulty transmission path are redirected to an associated redundant transmission path; and

a remote circuit to selectively switch a redundant transmission path for a faulty transmission path at a subscriber.

2. The protection switching mechanism of claim 1, wherein the remote circuit further comprises:

a relay for each transmission path.

3. The protection switching mechanism of claim 1, wherein the transmission paths are selected into groups comprising a plurality of standard transmission paths and a redundant transmission path, wherein the redundant transmission path is selectively coupled to replace a faulty transmission path among the standard transmission paths.

4. The protection switching mechanism of claim 3, wherein each group of transmission paths further includes a spare redundant transmission path selectively coupled to replace the redundant transmission path if the redundant transmission path is found to be faulty.

5. The protection switching mechanism of claim 3, wherein each group of transmission lines comprises up to 5 standard transmission lines and a redundant transmission line.

6. The protection switching mechanism of claim 3, further comprising:

a management unit coupled to control the multiplexer and the remote circuit, the management unit having a memory to store switching information.

7. The protection switching mechanism of claim 6, wherein the switching information stored in the memory of the management unit includes the grouping of standard transmission paths as well as which redundant transmission path is associated with which group of standard transmission paths.

8. The protection switching mechanism of claim 1, wherein the input signal is a digital signal 3 (DS3 signal) and the output signals are digital signals (DS1 signals).

9. The protection switching mechanism of claim 8, wherein each transmission path includes a digital subscriber line (DSL) portion.

10. The protection switching mechanism of claim 8, further comprising:

a line unit for each transmission path to provide an asynchronous DS1 interface with the DSL; and

a remote unit for each transmission line to provide an interface from DSL back to DS1 at a customer's premise.

11. A protection switching transmission path device comprising:

a central office including,

a multiplexer having an input and a plurality of outputs, and

a management unit coupled to control the multiplexer;

a remote circuit including,

a plurality of relays and

a controller card coupled to control the plurality of relays, wherein the control card is coupled to receive control signals from the management unit,

a plurality of standard transmission paths, each standard transmission path coupled between an output of the multiplexer and an associated relay; and

a plurality of redundant transmission paths, each redundant transition path is coupled between an output of the multiplexer and an associated relay, each redundant transmission path is further associated with a group of standard transmission paths, wherein if a standard transmission path in a group of transmission paths is detected as being faulty the management unit directs the multiplexer and the controller card to switch an associated redundant transmission path for the faulty standard transmission path.

12. The protection switching transmission path device of claim 11, wherein each standard transmission path further includes:

a standard line unit to provide an interface with output signals from the multiplexer, the standard line unit is positioned in the central office;

a remote line unit to provide an interface for received signals, the remote unit being positioned in the remote circuit; and

a standard transmission line coupled between the standard line unit and the remote unit.

13. The protection switching transmission path device of claim 12, further comprising:

an automatic protection switching (APS) bus coupled between the standard remote unit and the controller card to provide a path for control signals from the management unit to the controller card.

14. The protection switching transmission path device of claim 12, wherein the standard transmission line is a digital subscriber line (DSL).

15. The protection switching transmission path device of claim 14, wherein the DSL is further selected from the group consisting of a high-bit-rate digital subscriber line (HDSL) and a high-bit-rate digital subscriber line 2 (HDSL2).

16. The protection switching transmission path device of claim 15, wherein at least one of the standard transmission lines is HDSL and at least one of the standard transmission lines is HDSL2.

17. The protection switching transmission path device of claim 11, wherein each redundant transmission path further comprises:

a redundant line unit to provide an interface with output signals from the multiplexer, the redundant line unit is positioned in the central office;

a redundant remote line unit to provide an interface for received signals, the redundant remote unit being positioned in the remote circuit; and

a redundant transmission line coupled between the standard line unit and the remote unit.

18. The protection switching transmission path device of claim 17, further comprising:

an automatic protection switching (APS) bus coupled between the redundant remote unit and the controller card to provide a path for control signals from the management unit to the controller card.

19. The protection switching transmission path device of claim 17, wherein the redundant transmission line is a digital subscriber line (DSL).

20. The protection switching transmission path device of claim 19, wherein the DSL is further selected from the group consisting of a high-bit-rate digital subscriber line (HDSL) and a high-bit-rate digital subscriber line 2 (HDSL2).

21. The protection switching transmission path device of claim 20, wherein some of the standard transmission lines are HDSL and some of the standard transmission lines are HDSL2.

22. A protection switching device comprising:

a plurality of standard transmission paths coupled between a central office and a remote circuit;

a redundant transmission path selectively coupled to replace one in a group of the plurality of standard transmission paths;

the remote circuit having a switch relay for each standard transmission path, each switch relay is coupled to an associated standard transmission path, each switch relay having a first position to provide a connection to a subscriber and a second position to provide a connection to the redundant transmission path, wherein when one of the plurality of standard transmission paths is found to be faulty its associated relay is positioned to the second position; and

the remote circuit having a redundant relay for the redundant transmission path, the redundant transmission path is coupled to an associated redundant relay, each redundant relay having a first position to provide a current loop path and a second position to provide an open circuit, wherein when one of the plurality of standard transmission paths in a group of standard transmission paths is found to be faulty a redundant relay coupled to an associated redundant transmission path is placed in its second position so signals in the redundant transmission path are routed to the subscriber.

23. The protection switching device of claim 22, further comprising:

a test relay for each of the plurality of standard transmission paths, each test relay is coupled to an associated standard transmission path. Each test relay having a first position to provide a connection to a respective subscriber and a second position to provide a closed circuit loop, wherein a standard transmission path can be tested when the test relay is in the second test position by providing a signal to a first conductive line of the transmission line and monitoring its return in a second conductive line of the transmission line.

24. The protection switching device of claim 22, further comprising:

the central office having a multiplexer, the multiplexer having an input to receive an incoming signal and a plurality of outputs, wherein select outputs of the multiplexer are coupled to the plurality of standard transmission paths and one of the outputs is coupled to the redundant transmission path, wherein when a standard transmission path is determined to be faulty the output of the multiplexer assigned to the faulty standard transmission path is output to the redundant transmission path instead.

25. The protection switching device of claim 24, further comprising:

the central office having a management unit, the management unit coupled to the multiplexer to control output signals of the multiplex, the management unit also coupled to control the switch relays and the redundant relays.

26. The protection management device of claim 22, wherein each standard transmission path further comprises:

a standard line unit positioned in the central office;

a standard remote unit positioned in the remote circuit; and

a digital subscriber line (DSL) coupled between the standard line unit and the standard remote unit.

27. The protection management device of claim 26, wherein the DSL is a high-bit-rate digital subscriber line (HDSL).

28. The protection management device of claim 26, wherein the DSL is a high-bit-rate digital subscriber line 2 (HDSL2).

29. A protection switching mechanism comprising:

a multiplexer having an input coupled to receive an input signal and a plurality of outputs to output a plurality of output signals;

a plurality of line units, each line unit is coupled to selectively receive an associated output of the multiplexer;

one or more redundant line units, each redundant line unit is selectively coupled to receive an output of the multiplexer associated with a line unit that is coupled to a faulty transmission line;

a remote unit for each line unit, each remote unit is coupled to an associated line unit;

a redundant remote unit for each redundant line unit, each redundant remote unit coupled to an associated redundant line unit;

a relay for each remote unit and each redundant remote unit, each relay for each remote unit is coupled an associated remote unit and each relay for each redundant remote unit is coupled to an associated redundant remote unit; and

a management unit to control the output of the multiplexer and the relays, wherein when the management unit detects a line unit coupled to a faulty transmission line an output of the multiplexer assigned to the line unit coupled to the faulty transmission line is directed to an associated redundant line unit instead and a relay coupled to the faulty transmission line as well as a redundant relay associated with the redundant line unit are switched to provide an alternate signal path around the faulty transmission line.

30. The protection switching mechanism of claim 29, wherein the management unit further comprising:

a memory to store switching information and

logic circuitry.

31. The protection switching mechanism of claim 29, wherein the management unit further having a craft port to provide a user interface.

32. The protection switching mechanism of claim 29, wherein the management unit further having a TL1 port and a 10base-T port.

33. The protection switching mechanism of claim 29, wherein the plurality of line units and associated remote units are sectioned into groups, each group of line

units and associated remote units include a redundant line unit and an associated redundant remote unit to selectively replace one of the line units and associate remote unit.

34. The protection switching mechanism of claim 33 wherein management unit controls the grouping of the line units and associated remote units.

35. The protection switching mechanism of claim 33, further comprising;

a multiplexer circuit containing the multiplexer, the line units and redundant line units, the multiplexer circuit further comprising a multiplexer memory to store switching information.

36. A remote circuit comprising:

a remote shelf enclosure having a plurality of remote unit slots, a protection remote unit slot, a protecting switching controller slot and a power supply module slot;

a remote unit card having a remote unit removably coupled in each remote unit slot;

a protection remote unit card having a protection remote unit removably coupled in the protection remote unit slot;

a protection switching controller card having a protection switching controller removable coupled in the protecting switching controller slot; and

a power supply module card having a power supply module removably coupled in the power supply module card slot.

37. The remote circuit of claim 36, wherein the plurality of remote slots comprise 5 slots.

38. The remote circuit of claim 36, wherein the protection switching controller card has a plurality of light emitting diodes to convey the status of the remote units and the protection remote units.

39. The remote circuit of claim 36, wherein the remote shelf enclosure has a back side, the back side having a plurality of openings adjacent the plurality of remote unit cards and the protection remote unit card, wherein each remote unit card and the protection remote unit card has a input connection positioned adjacent an associated opening when selectably coupled in an a respective slot.

40. The remote circuit of claim 36, wherein the remote shelf unit has an output connection for each of the remote unit slots and the redundant remote unit slot.

41. The remote circuit of claim 36, further comprising:

an automatic protection switching (APS) bus coupled between the redundant remote slot and the protection switching controller slot.

42. The remote circuit of claim 36, further comprising:

an automatic protection switching (APS) bus coupled between the alternate redundant remote slot and the protection switching controller slot.

43. The remote circuit of claim 36, wherein the protection switching controller card is coupled to receive its power from the power supply module card.

44. The remote circuit of claim 36, wherein the protection switching controller card is coupled to an external power supply.

45. The remote circuit of claim 36, wherein the protection switching controller slot is positioned adjacent the redundant remote unit slot; and further wherein the protection switching controller slot receives its power from the redundant remote unit slot.

46. The remote circuit of claim 45, wherein a remote unit slot adjacent the redundant remote unit is coupled to the protection switching controller slot to provide power when the power in the redundant remote unit slot fails.

47. A method of operating a transmission path network, the method comprising:

grouping a plurality of transmission paths with an associated redundant transmission path;

coupling an output signal from a multiplexer addressed to a faulty transmission path in the group of transmission paths to the redundant transmission path; and

coupling the redundant transmission path to replace the faulty transmission path at a subscriber.

48. The method of claim 47, further comprising:

replacing the faulty transmission path at the subscriber with a plurality of relays at a remote circuit.

49. The method of claim 47, further comprising:

controlling the multiplexer and the relays with a management unit.

50. The method of claim 49, wherein controlling the multiplexer further comprises:

sending a control command to the multiplexer implementing a time slot assignment to output signals through a selective output of the multiplexer.

51. The method of claim 49, wherein controlling the relays further comprises:

sending control commands to a respective line unit in a transmission path;

passing the control commands through an embedded operating channel to an associated remote unit in the transmission path;

passing the control commands through an automatic protection switching bus to a controller card in a remote circuit that controls the relays; and

selectively positioning the relay in response to the control signals.

52. The method of claim 49, further comprising:

programming a memory in the management unit to store switching parameters.

53. The method of claim 52, further comprising:

storing into the memory which transmission lines are the redundant transmission paths.

54. The method of claim 52, further comprising:

storing into the memory the grouping of transmission paths.

55. The method of claim 52, further comprising:

storing into the memory a switching back time, wherein a faulty transmission line will be used again if it is free from errors for a period of time determined by the switching back time.

56. The method of claim 52, further comprising:

storing into the memory alarm parameters.

57. A method of switching transmission paths, the method comprising:

grouping a plurality of standard transmission paths in separate groups;

monitoring each standard transmission path for errors by sending a test signal from a central office to a remote circuit and back;

detecting errors in a standard transmission path in one of the standard transmission paths in a group of standard transmission paths;

outputting signals directed to the standard transmission path with errors from a multiplexer in the central office to a redundant transmission path associated with the group of standard transmission paths instead of the standard transmission path with errors; and

coupling the redundant transmission path to an end portion of the standard transmission path with errors at the remote circuit, wherein signals directed to the standard transmission path with errors are routed around the standard transmission path.

58. The method of claim 57, further comprising:

storing switching parameters in a memory in the central office.

59. The method of claim 57, further comprising:

switching back to the standard transmission line once a period of time has passed in which no further errors are detected.

60. The method of claim 57, further comprising:

monitoring the redundant transmission path for errors.

61. The method of claim 60; further comprising:

when an error is found in the replacing redundant transmission path, replacing the redundant transmission path with a standard transmission path in an associated group of standard transmission paths.

62. The method of claim 57, wherein coupling the redundant transmission path to an end portion of the standard transmission path with errors at the remote circuit further comprises:

switching a relay in the remote circuit that is coupled between the transmission line with the error and a subscriber to a position that couples the redundant transmission line to the subscriber; and

switching a redundant relay in the remote circuit that is coupled to the redundant transmission path to an open circuit position, wherein the signals in the redundant transmission path are passed to the subscriber.

63. The method of claim 62, wherein switching the relay and the redundant relay further comprises:

providing a control signal from a management unit in the central office.

64. The method of claim 57, wherein outputting signals directed to the standard transmission path with errors from a multiplexer in the central office to a redundant transmission path associated with the group of standard transmission paths instead of the standard transmission path with errors, further comprises:

providing a control signal to the multiplexer from a management unit directing input signals to the multiplexer to specific outputs of the multiplexer.

65. The method of claim 64, further comprising;

storing switching parameters in a memory of the management unit.

66. A method of operating a remote shelf enclosure, the method comprising:

selectively coupling a plurality of remote units in associated remote units slots;

selectively coupling a protection remote unit in a protection remote slot;

selectively coupling a protection switching controller in a protection switching controller slot;

selectively coupling a power supply module in a power supply slot;

coupling a standard transmission path to each of the remote units;

coupling a protection transmission path to the protection remote unit;

monitoring the standard transmission paths for errors; and

when errors are detected in a standard transmission path, switching an output of the standard transmission path with the errors for an output of the protection transmission path.

67. The method of claim 66, wherein the plurality of remote units is five remote units.

68. The method of claim 66, further comprising:

monitoring if the protection switching controller is coupled in the protection switching controller slot.

69. The method of claim 66, further comprising;

illuminating a light emitting diode (LED) associated with a standard transmission path on the protection switching controller when an error has been detected.

70. The method of claim 66, further comprising:

illuminating a LED associated with the protection remote unit when the protection remote unit when it is ready to pass a signal around a transmission path that has errors; and

pulsating a LED on an off when an error has been detected in the protection remote unit.